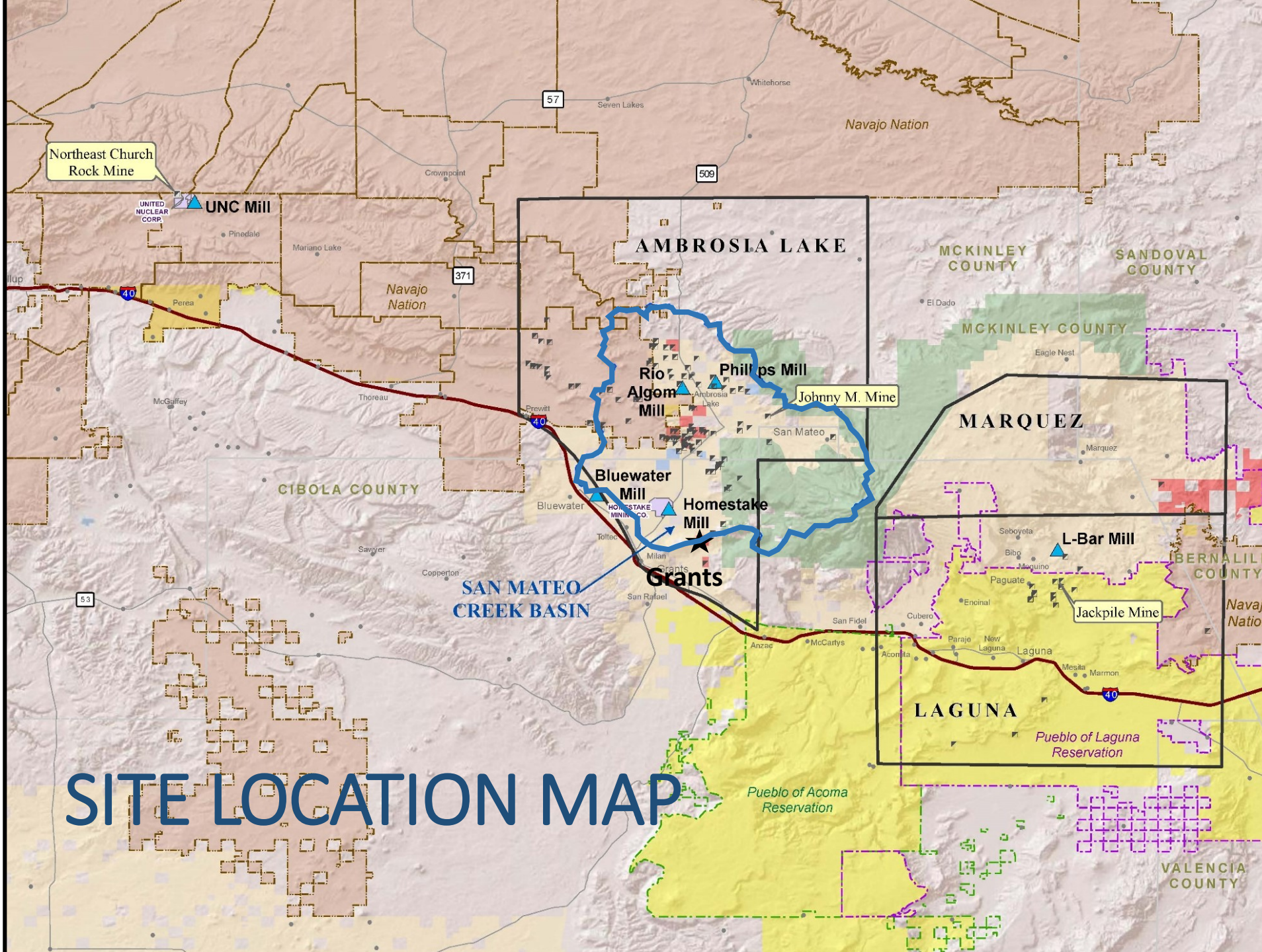




# EPA GROUND WATER INVESTIGATION STATUS UPDATE

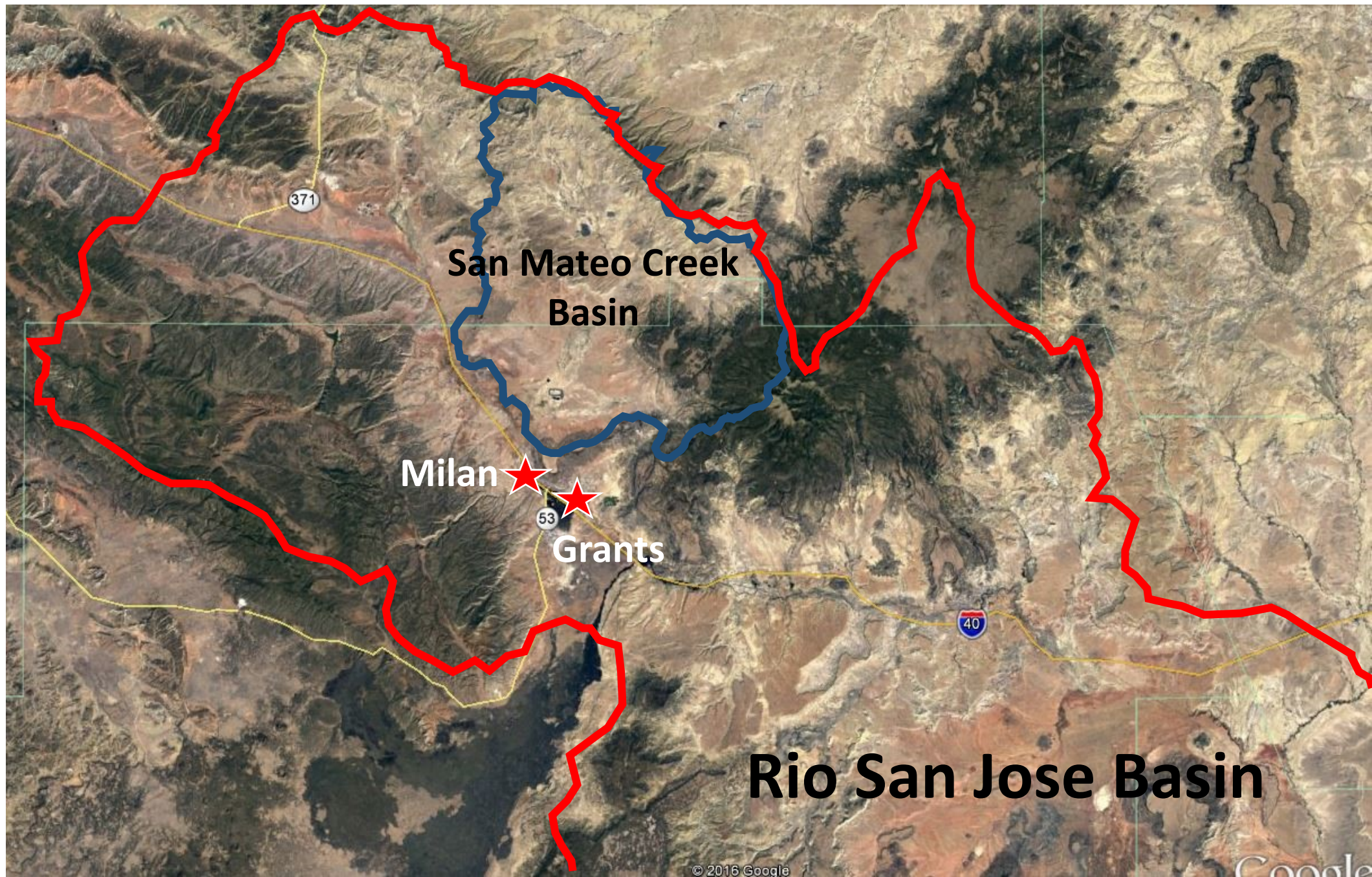
## San Mateo Creek Basin Uranium Legacy Site

November 17, 2016 Community Meeting  
Grants, New Mexico



# SITE LOCATION MAP





**San Mateo Creek  
Basin**

**Milan**

**Grants**

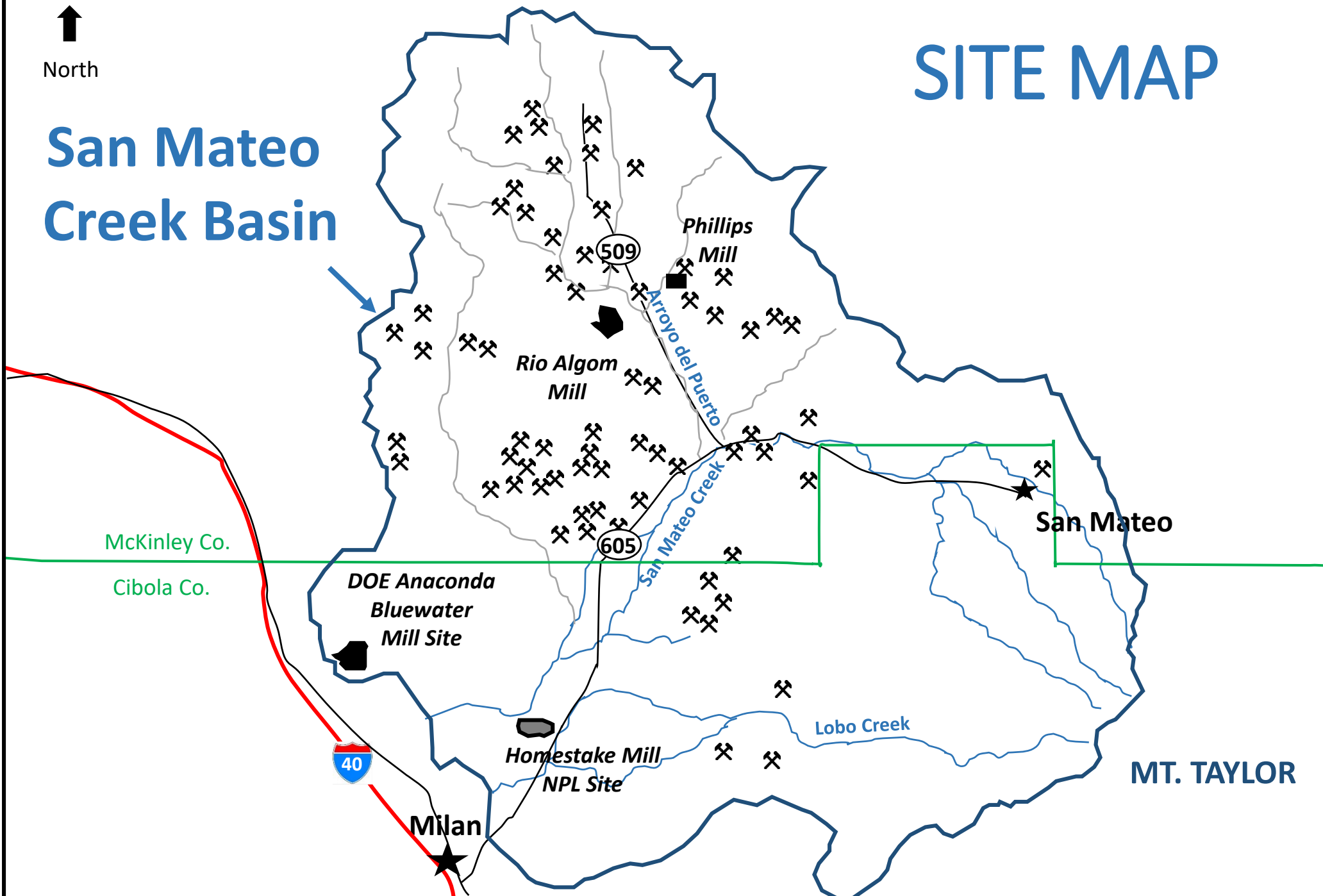
**Rio San Jose Basin**



# SITE MAP

↑  
North

## San Mateo Creek Basin



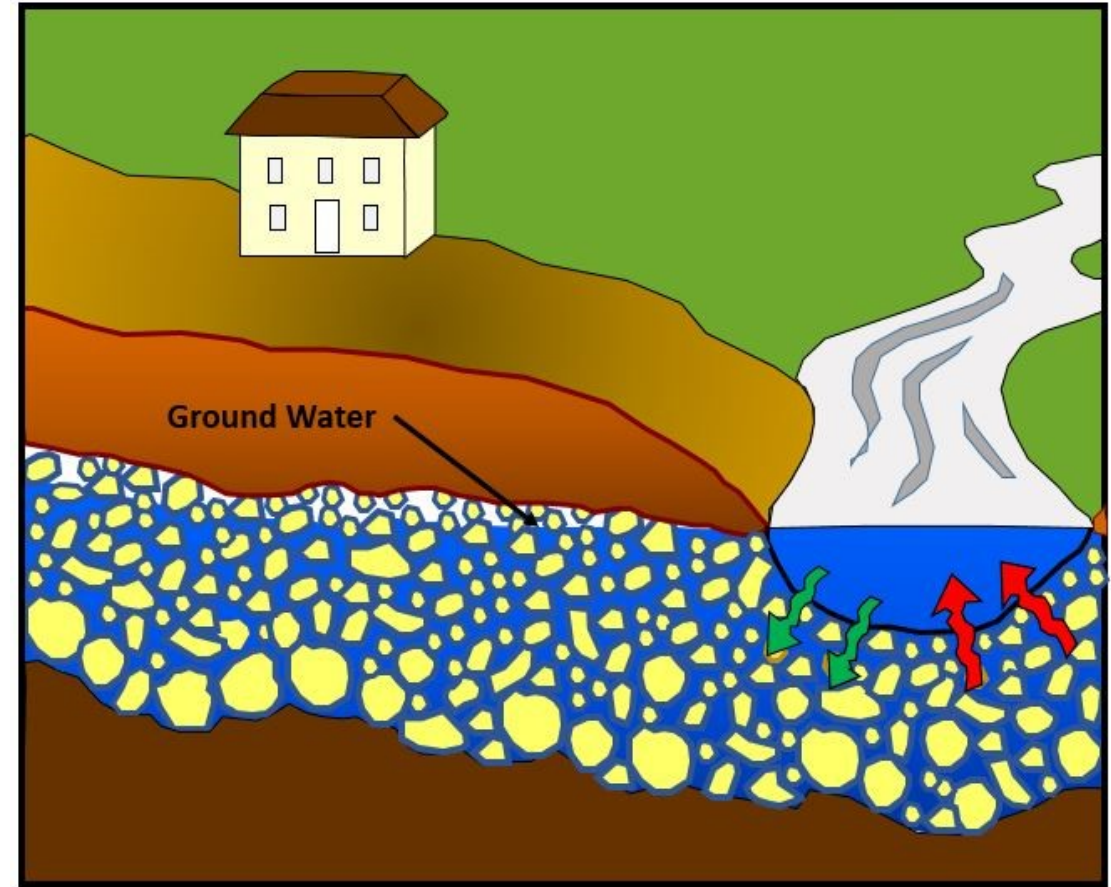
# PROJECT OBJECTIVE

Assess ground water impacts by uranium mining industry



# WHERE IS THE GROUND WATER?

- Alluvial Ground Water
  - Shallow ground water
  - At depths reaching **120 feet**
  - In sediments along drainages
- Bedrock Ground Water
  - Deeper ground water
  - Hundreds of feet deep

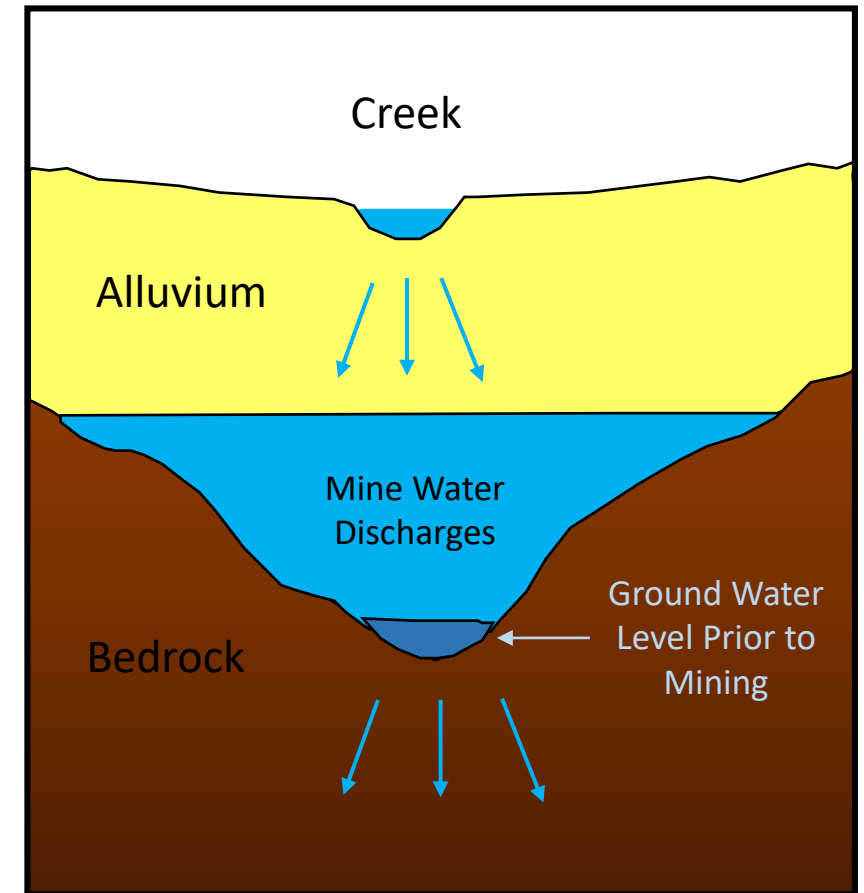


Modified from City of Las Cruces  
Poster Display



# HOW DID MINING OPERATIONS AFFECT GROUND WATER?

- ***Discharged billions of gallons*** of mine water to creeks and arroyos
- ***Created continuous flow of water*** in creeks and arroyos all year
- ***Water infiltrated*** into ground
- ***Increased amount of ground water*** in alluvial sediments and bedrock
- ***Changed quality*** of ground water



Draft – For Discussion Purposes Only  
Not to Scale



# MINE WATER DISCHARGE

Artificially  
Created  
Flows in  
Creeks  
and Arroyos



Wet Mine



# MULTI-PHASED INVESTIGATION

## ***Phase 1***

***Shallow Alluvial Aquifer  
2012 – 2016***

## ***Phase 2***

***Bedrock & Alluvial Aquifers  
2015 – 2017***

## ***Phase 3***

***Conceptual Site Ground  
Water Model  
2016 - 2018***



**Wet Alluvial Sediments**



**Bedrock Sandstone**



**Drill Bit and Piping**

# PHASE 1 ACTIVITIES COMPLETED

- **30** Boreholes Drilled
  - **6** monitoring wells installed
  - **24** boreholes dry
- **15** Existing Wells Sampled
  - **10** private wells
  - **5** industry monitoring wells



Core Sample



# PHASE 1 RESULTS SUMMARY

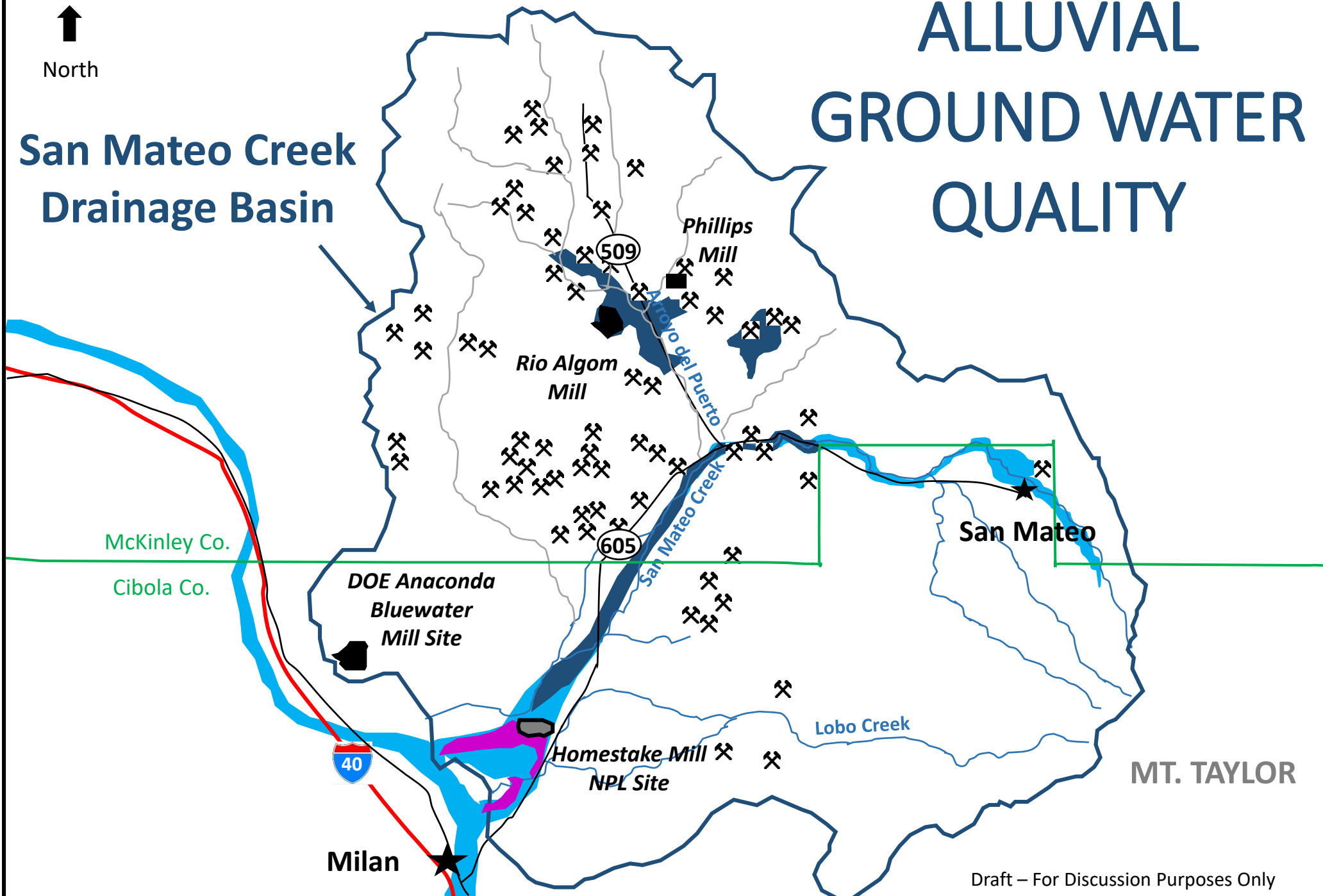
- Attempt to Characterize Alluvial Water Quality had **Mixed Results**
  - Lack of Natural Saturation in Many Areas Investigated
- Alluvial **Water Quality Varies** Across Basin
  - Good quality upgradient of mines and mills
  - Poor quality downgradient of mines and mills
- Mine Discharge Water **Increased Saturation** in Alluvium
- Mine Discharge **Water Draining Out** of Alluvium Today

# ALLUVIAL GROUND WATER QUALITY

## San Mateo Creek Drainage Basin



North



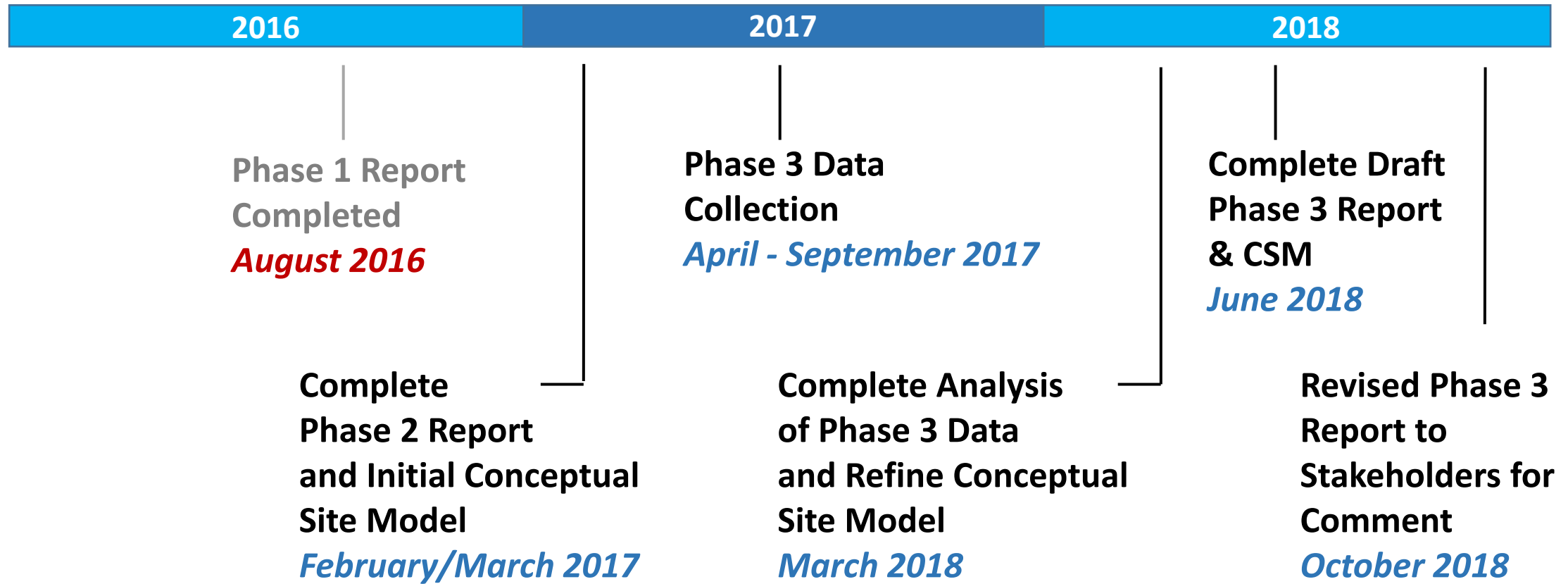
-  Alluvial Ground Water
-  Poor Alluvial Water Quality (Exceeds Standards)
-  Poor Alluvial Water Quality Contaminated by Homestake NPL site (Exceeds Standards)

MT. TAYLOR

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# PLANNED ACTIVITIES FOR GROUND WATER INVESTIGATION



# Other Slides



# PHASE 1 WELL SAMPLING LOCATIONS

North  
↑

San Mateo Creek  
Basin

McKinley Co.

Cibola Co.

DOE Anaconda  
Bluewater  
Mill Site

Homestake Mill  
NPL Site

Milan

Phillips  
Mill





Rio Algom  
Mill

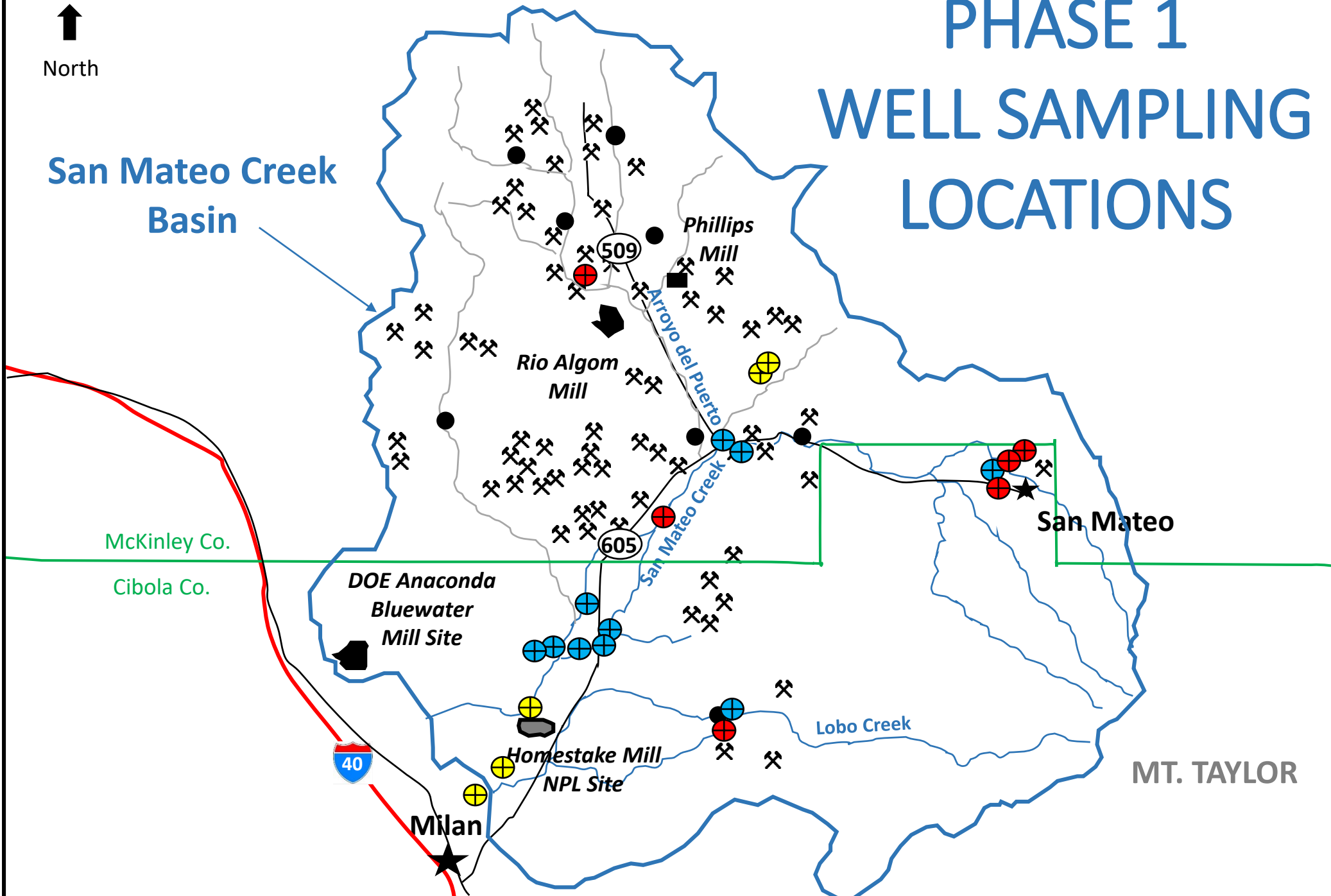
Aroyo del Puerto  
San Mateo Creek

Lobo Creek

San Mateo

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-  EPA Alluvial Monitoring Well
-  Industry Monitoring Well
-  Private Well
-  Dry Borehole



**A**

# CROSS SECTION A-A'

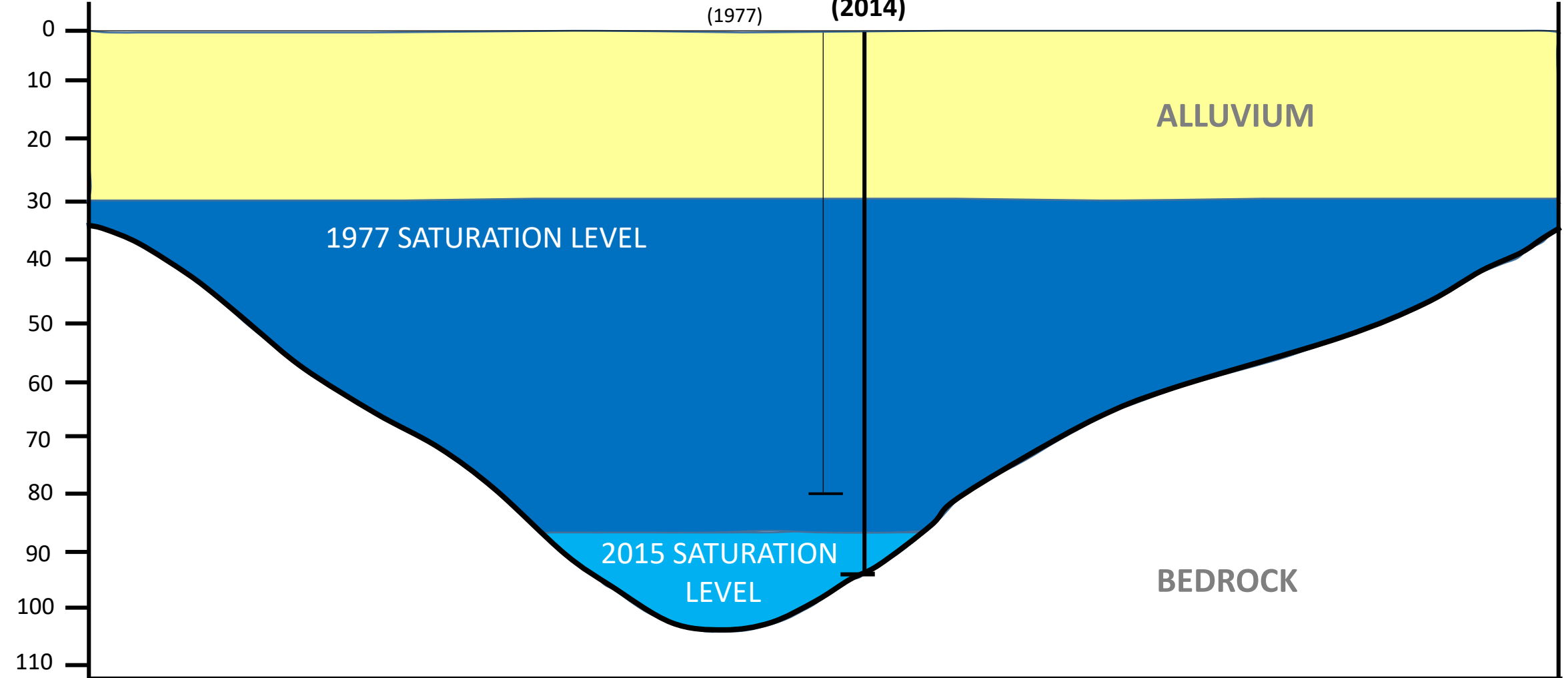
## CENTRAL SAN MATEO CREEK BASIN AREA

**A'**

West

East

Depth  
(ft)





# URANIUM AND TDS IN ALLUVIAL GROUND WATER

San Mateo  
Creek Basin

**Uranium**  
**Total Dissolved  
Solids (TDS)**

DOE Anaconda  
Bluewater  
Mill Site

Phillips  
Mill

Rio Algom  
Mill

Homestake Mill  
NPL Site

Milan

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-  EPA Background Well
-  Well downgradient to Legacy Mines
- 16** Uranium (ppb)
- 16** Total Dissolved Solids (ppm)
-  Alluvial Water
-  Poor Alluvial Water Quality
-  Wet Mine